

GAMES RUN

	Beginning of Stage 1:	End of Stage 1:
	<ul style="list-style-type: none"> Slight expansion of Banks DMC/ CA Aqueduct Intertie Unlimited Joint Point of Diversion 	<ul style="list-style-type: none"> Full Banks expansion DMC/ CA Aqueduct intertie Unlimited Joint Point of Diversion 290 kaf expansion of Shasta Reservoir 200 kaf of in-Delta storage 500 kaf of groundwater storage in export area
<ul style="list-style-type: none"> All Project reoperation chargeable to b(2). No b(1) reoperation allowed. No EWA assumed, except for E/I relaxations. 	GAME 1A	GAME 1B
<ul style="list-style-type: none"> EWA with water purchase/ facility rights. B(2) water for VAMP export reductions. EWA "no harm" operations for all other export shifts. Focus b(2) water upstream 	GAME 2A	GAME 2B
<ul style="list-style-type: none"> Biologists control Project operations Target is protection adequate for regulatory reliability Projects respond to operations shifts. 	GAME 3A	GAME 3B

[Insert export graphic]

EXPORTS

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EXPORT SHIFTING FOR FISH

[Insert graphic showing amount of export shifting for each game.]

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FISH PROTECTION

[Insert template graphic from Fris for games 1/2/3]

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WATER QUALITY

[Insert DSM run as example?]

KEY OUTCOMES OF GAMES

- Game 1
 - Limited ability to reoperate limits environmental benefits.
- Game 2
 - Introduction of reoperation increases total fish benefits without loss of exports. Would require EWA with access to several hundred thousand acre-feet of water, if needed.
- Game 3
 - Major increase in fish benefits. However, consumes all remaining flexibility in system and reduces exports. No ability to fill storage south of Delta except in wettest years. Would require permanent buyout of several hundred thousand acre-feet of export demand.

CONCLUSION:

- B(2) account should be supplemented with EWA.
- EWA is based upon reoperation of existing facilities to generate more fish friendly operational patterns.
- EWA makes reoperation palatable to the Projects by assuming the risk associated with more fish friendly operations
 - EWA assets are typically used as collateral to guarantee the Projects that reduced exports will be repaid. E.g., 100 kaf of EWA groundwater should allow the EWA to reduce exports by 100 kaf in the winter. If San Luis Reservoir does not recoup the losses before the water is needed by users, then the EWA must pay over the 100 kaf.
- Fish friendly reoperations are frequently without cost. Therefore, EWA investments are highly leveraged.

[Refer to new graphic showing ratio of export shifts to water purchased or pumped out of groundwater]

- It is essential that the ultimate b(2) accounting rules not discourage the Projects from participating in "no harm" reoperation. If they do, then the effectiveness of the EWA will drop significantly.
- EWA needs for protection above WQCP protections most acute in wetter years. Water user needs most acute in dry years. This offset creates opportunities for sharing of assets.
- B(2) EWA operations tend to force exports out of the winter/spring and into the summer/fall. Could increase average salinity of water exported.
- B(2) EWA operations tend to reduce exports during February peak in Delta TOC. Could reduce average TOC of water exported.

TOOLS

All infrastructure tools create new flexibility. That flexibility may be converted into increases in exports, increases in reoperation to benefit fish, or a combination of the two. The benefits of infrastructure expansion should be split between the EWA and Projects to assure mutual benefit and mutual support.

- Joint Point of Diversion/ Expansion of Banks Pumping Rights. Without these tools, unlikely that CALFED can create enough flexibility to simultaneously meet stated needs of fish agencies and water users.
- Delta Storage. Highly efficient storage with yield/storage capacity ratio of about 100%. Intertie to Clifton Court improves even more. However, supply is biased toward wetter years. Tool is, therefore, most appropriate for EWA or CVP.
- South of Delta storage. Valuable, provided that export capacity exists to fill reliably in wet years. Major benefits are dry year supplies and as collateral to EWA. However, the storage analyzed to date (500 kaf of groundwater) is too small provide major benefits to water users during extended droughts.
- North of Delta storage. Valuable. Easier to fill than storage in export area. Moreover, no capacity problems with transport across Delta during dry years. However, volumes tested to date (290 kaf expansion of Shasta) too small to make a major difference in supply or fish protection.
- Yuba storage. The Yuba system remains underutilized. Water purchases from Yuba could provide immediate benefits at low cost, without supply impacts to the local area and without the need for new infrastructure.
- Transfers. Options provide a key tool for the EWA, though may actually purchase water in a minority of years. Transfers by water users are equivalent to shortages and were not analyzed.
- Efficiency. Potential benefits to EWA and user supplies not analyzed in gaming.